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ABSTRACT

This unit emphasizes the integration of software in a focus on the classroom instruction process. Student activities are based on plans and ideas for instructional units presented by a teacher who describes and demonstrates the activities. Integration has occurred when computer applications are included in an instructional activity. This guide should provide models for actual use, along with advice on planning, preparation, and teaching. Part 1, "Unit Description," provides an outline of the unit including objectives, lesson descriptions, time schedules, and materials for teacher preparation. Part 2, "Teacher Resources," includes sections entitled "How are the Social Studies Database products used in the classroom?" and "What are the advantages and disadvantages of using Databases?"; an outline of pre-activities which introduce databases to students; and a list of activities for developing the concept of databases and information searching. Part 3, "Student Activities," includes lesson plans entitled: "Retrieving Information"; "Recognizing Patterns and Analyzing Relationships"; and "Interpreting Data and Making Predictions." An Apple II+ or IIe personal computer is required, as are one "MECC Dataquest: The Fifty States" diskette per computer and 50 "State Information" cards which can be made by using the MECC Dataquest program. (APG)

Correlating Computer Database Programs with Social Studies Instruction

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PREFACE

The integration of computer applications with instruction has usually been approached by matching the content presented by a program with the major instructional objectives in a subject area. Several state education agencies sponsor projects which conduct the matching activity, usually with a focus on state approved or mandated instructional objectives, and are collectively addressing most subject areas. Rather than duplicate that activity, we have decided to put our efforts into integration of software in a focus on the classroom instruction process. We are basing the student activities on plans and ideas for instructional units presented by teachers in a seminar called a "forum," where teachers describe and demonstrate their activity. At the end of a forum, copies of each presentation are given to all participants and to the Lab.

We believe that integration has occurred when a computer application is included in an instructional activity. A guide such as this one should provide models of actual use along with advice on planning, preparation and teaching, to "show the way" for teachers. It will provide assistance in a manner more direct than, and complimentary to, objective matching documents from SEAs.

Some material in the teacher resource section is drawn directly from another OERI deliverable on database software for Social Studies.

I. UNIT DESCRIPTION

UNIT DESCRIPTION

CURRICULUM AREA: Social Studies

TITLE: The Fifty States

OBJECTIVES:
1. Learn to develop appropriate questions about the fifty states, using database fields as guidelines.
2. Answer questions by retrieving information from a database.
3. Recognize patterns and analyze relationships in data.
4. Interpret data and make predictions.

GRADE LEVEL: 7-9 (may be adapted for higher grades)

PREREQUISITE SKILLS NEEDED: Basic computer skills (ability to turn computer on and off, use space bar, return key and arrow keys)

COMPUTER REQUIREMENTS:

HARDWARE: Apple II+ or IIe with one disk drive, monitor and printer (optional). Large monitor preferred for large group presentations during pre-activity.

SOFTWARE: One MECC Dataquest: The Fifty States diskette per computer.

STUDENT/COMPUTER RATIO: One computer per group (two or three students per computer is ideal).

ARRANGEMENT: Lab situation (preferable) or one computer in the classroom (with a schedule for student computer time).

DESCRIPTION OF LESSONS:

PRE-ACTIVITIES: See "Activities for Developing the Concept of Databases" and "Activities for Developing Strategies for Information Searching."

COMPUTER ACTIVITIES: See Student Activities #1, 2, and 3.

FOLLOW-UP ACTIVITIES:
1. Do a research report using the database for reference source.
2. Develop a personal database (small group or individual project).

CLASSROOM MANAGEMENT:

TOTAL TIME: Seven or eight class periods, depending on students' abilities.

UNIT SCHEDULE:

Days 1 and 2: "Activities for Developing the Concept of Databases" and "Activities for Developing Strategies for Information Searching"

Day 3: #1--Retrieving Information

Day 4 and 5: #2--Recognizing Patterns and Analyzing Relationships

Days 6 and 7: #3--Interpreting Data and Making Predictions

TEACHER PREPARATION:

MATERIALS NEEDED: Fifty state information cards (see "Activities for Developing the Concept of a Database" #5)

TEACHER "TO DO" LIST:

1. Make sure there is one MECC Dataquest: The Fifty States diskette for each computer.
2. Make 50 state information cards.
3. Set up one computer with a large screen monitor (if available).
4. If there is only one computer available, develop a schedule for student computer use.
5. If possible, review activities with a student aide who would be available to assist you during the unit.

II. TEACHER RESOURCES

DATABASE SOFTWARE FOR SOCIAL STUDIES
(excerpted from the MicroSIFT Quarterly Report, May 1986)

WHAT IS THIS REPORT ABOUT?

A Short Quiz

1. What is the population of New Hampshire?

   If you don't know, you can look in an almanac or ask a friend. Students learn how to get information like this early in their school careers.

2. What other states have similar populations?

   This question is trickier because you need some information about all of the states before deciding what the word "similar" means. Still, this is a task that students can do with some reasoning skills and an almanac or encyclopedia.

3. What other things do states with similar populations have in common?

   Now we are talking research. It is this kind of question that demands that nebulous quality which educators are fond of calling problem solving skills.

This issue of the MicroSIFT Quarterly report is about a set of tools which help to teach these skills while teaching social studies. The tools are called database managers and what they create are databases.

Database managers (DBM) let a student store information in a computer, retrieve it, display or print it and (sometimes) sort, count, total, or average. They have two major components: the database management software which gives the computer the ability to perform these tasks, and the data or information which is manipulated by the software. Generally, these two components are on separate disks. There is a detailed explanation of database managers and the associated terminology in the Appendix.

HOW ARE SOCIAL STUDIES DATABASE PRODUCTS USED IN THE CLASSROOM?

Designing a database--In designing a database, students are involved in many activities which develop higher level thinking skills, organizational skills and communication skills. The list of activities below describes the sequence generally followed when creating a database with students.

- Clearly define the class of information to be contained in the database, i.e., define what makes up a record
- Conduct research to identify what information is available on the topic
- Examine the data for commonalities and differences
- Define the fields which make up the records
- Define the vocabulary and format of the fields
- Create the forms on the computer as well as printed data entry forms

In a classroom setting, these activities could be structured to involve an entire classroom in the design of a single database, or the class could be divided into small groups where each group designs a database. Databases could also be designed individually by more advanced students.

Building a database--Students can develop research skills and work cooperatively by collecting the information containied in a database. The tasks involved include:

- Researching and collecting the information specified in the database design
- Verifying the data for accuracy and consistency in terminology
- Entering and editing the data
- Modifying and debugging the database design

A goal in building a database is to collect all the records into one file. There are several ways to do this. One is to dedicate one computer work station as the central data entry point. All students enter their data in one master file that is backed-up FREQUENTLY. Another method involves students doing the data entry at several work stations on several disks. When each student has completed his/her data entry, the records are copied onto a master file disk.

Using these database--An existing database may be used to provide experiences for the student which range from simple to complex:

- Information retrieval. At the simplest level, the database can be used as a resource of information. For example, a database of states could be used to find the population of New Hampshire.

- Recognizing patterns and trends. Students might examine a database on population mobility for patterns in the number of families moving to a new community.

- Analyzing relationships. Have students examine a database on planets to determine the relationship between the orbital velocity and the distance from the sun.

- Testing hypotheses. A database on states might be searched to test the hypothesis that most of the population in the U.S. is located near a major waterway.

- Interpreting the data. A database of countries could be sorted by education level, then the type of government currently in power studied. What can be inferred from this?

- Thinking Critically. The students could examine the words used to describe the various governments in a countries database to check the validity of the classification.

A database can be used in any classroom setting. With the whole class the teacher can direct a demonstration using a large screen monitor. Small groups can work at one or more stations or students can work individually or in pairs in a computer lab.

WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF USING DATABASES?

Teachers familiar with the classroom use of database packages have identified the following advantages:

- One general purpose database management package can be used in a wide variety of topic areas and levels.

- A database can be created and used which relates to these specific topics covered in any social studies curriculum.

- Using the computer as a tool to solve problems is a real world application of the computer which cannot be performed using any other media.

- Using the database develops higher level thinking skills.

- The activities are motivating because the students feel they have control over the data.

The dis-advantages are expressed more as cautions to the teacher:

- The teacher must decide when and if a computerized database activity is better instructionally than a printed or written research activity. Some uses of databases could be achieved just as well using existing print materials found in a library.

- Managing the activity requires a significant amount of planning and background work. Teacher preparation includes planning for:

  --Disk handling and making back-ups
  --Maintaining the security of the student's records
  --Scheduling time at the work stations.

PRE-ACTIVITIES: DEVELOPING THE CONCEPT OF DATABASES AND STRATEGIES FOR INFORMATION SEARCHING

INTRODUCTION

The concept "database" requires some introductory explanation to students. If they understand how a database is created and how it functions, they are better equipped to use one to its fullest potential. By doing some "ground work," teachers can start the database activities knowing that the students have some common knowledge.

In this lesson, students work to solve specific problems after some general information has been given. They then review the basic arrangement of the database program MECC Dataquest: The Fifty States.

SOCIAL STUDIES THEME: Understanding and using databases

INSTRUCTIONAL PURPOSE: To explain the term "database," and have students understand its organization.

OBJECTIVES:

- Understand the term "database"
- Understand the basic organization of a database
- Recognize categories (fields)
- Formulate appropriate questions when accessing information

GRADE LEVEL: 7-9

PREREQUISITE SKILLS: None needed

TOTAL TIME: Two periods

MATERIALS NEEDED:

- One MECC Dataquest: The Fifty States database diskette per computer.
- Apple II+ or IIe with 64k with a monitor (preferably large screen and one disk drive.
- Fifty "States Information" cards (see #5).

ACTIVITIES FOR DEVELOPING THE CONCEPT OF DATABASES

1. Define the term "database." Have students suggest their definitions of a database, and write these on the board. Discuss the common features of their suggestions. Emphasize that a database is an organized collection of information (e.g., a phone book: White Pages includes names and phone numbers arranged in alphabetical order; and Yellow Pages lists businesses and phone numbers arranged by topic, in alphabetical order).

2. The information in a database is on one topic arranged in an organized way. It is NOT a haphazard collection of facts. Use the example of the phone book again. The white pages include names and numbers in a systematic arrangement. Ask students how they would find information if the names and numbers were jumbled together in no specific order.

3. Students need to know how to match their questions to the information available in the database. For example, a student cannot find out how to feed a gerbil in a database on U.S. presidents! Suggest several topic ideas for databases (e.g., cars, pets or pizza). Have students offer ideas for information which could go into each database, and write their suggestions on the board. Then have students develop appropriate questions for each topic, based on the kinds of information submitted.

4. Information in databases is arranged by category or "field" and this arrangement makes it much easier to find or "access" information. Have students select a favorite topic like sports or music. Then have them write down one piece of information on the topic. Next, classify the students' information into fields consistent with the topic. This shows students how information can be organized in a database. If the database arrangement is understood, students can develop appropriate, answerable questions.

5. Databases can help users find information quickly and accurately. Demonstrate this concept by giving the students a problem to solve. What state was admitted to the Union after 1890, is located in the Pacific region, ranks in area from 25th to 50th (1 is largest, 50 is smallest), has an average temperature greater than 50 degrees, has an average precipitation less than 36 inches, and has a per capita income greater than $12,000?

Make 50 cards (one for each state) with the following information on each one: name of state, date of admission, geographic region, rank in area, annual average temperature, annual average precipation, and per capita income. These cards can be made by using the "MECC Dataquest: The Fifty States" database program. (Select the program "1. States Database" and then choose the "All the states" option from the main menu. Select the categories listed above, indicate selection complete when finished, select the print option, and print the information for the cards.) Cut out the printed information, paste on cards, and laminate (optional). Hand out all the cards so that each student has at least one.

The students' group task is to find the answer by checking information on all 50 cards. This will probably be time-consuming, noisy, and unsuccessful! Set a time limit before students begin their search.

ACTIVITIES FOR DEVELOPING STRATEGIES FOR INFORMATION SEARCHING

6. When time is up, load "MECC Dataquest: The Fifty States" into a computer (preferably one hooked up to a large screen monitor), and go through the steps to find the answer to the question. Point out the instructional screens available to students: 1. All the States, 2. Specific States, 3. States Selected by Category, or 4. Return to the Main Menu. "MECC Dataquest: The Fifty States" allows students to choose from among these three question types.

7. Emphasize the primary menus from which students can make their selections: the states menu (lists the 50 states alphabetically), the search menu (lists 28 searchable categories, with submenus for each category which students can use to further define their searches), and the report menu (lists 43 reportable categories and includes the 28 searchable categories).

8. After finding the answer to the group's question, have students suggest questions which require using the "All the States" menu. An example is "What is the nickname for each state?" Demonstrate the procedure by searching for the information needed to find the answer. Note that choosing this menu takes the student immediately to the report menu where categories are listed. Then the student selects the category of information needed and finishes with "Selection Complete." "Report Options" is the next menu displayed. The student can choose to see the report, print the report, ask a new question, or return to the main menu.

9. Devise questions which require use of the "Specific States" menu. An example might be "What is the number of counties in Oregon and Washington?" This menu takes the student to the states menu, from which he or she chooses the state names needed, ending with "Selection Complete." This choice takes the student to the report menu where the category needed can be selected, followed by "Selection Complete." This signals the program to prepare the report and offers the student the opportunity to see or print it.

10. In #5, students were asked a question which can be more easily answered using a database. To demonstrate, have students use the third question menu, "States Selected by Category." Ask again, "What state was admitted to the Union after 1890, is located in the Pacific region, ranks in area from 25th to 50th (1 is largest, 50 is smallest), has an average temperature greater than 50 degrees, has an average precipitation less than 36", and has a per capital income greater than $12,000?" Students will see a search menu listing the 28 categories of information. Choosing "Date of Admission" will take them to a submenu from which they would choose "After a specific year." After entering 1890, students are returned to the search menu. Next, the category "Geographic Region" should be selected and "Pacific" chosen from the submenu. Under "Rank in Area" choose a range of 25 to 50, and make the appropriate entries under the temperature, precipitation and income categories (do not use commas when entering the income figure).

11. Review the three question types, the three menus, and the procedures of searching and reporting. Preview the next activity by telling students they will work in small groups on a computer and will practice retrieving information from "MECC Dataquest: The Fifty States."

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III. STUDENT ACTIVITIES

#1: RETRIEVING INFORMATION

INTRODUCTION

A "dedicated" database is one which includes information or "data" on a specific subject. This information was researched, collected, and typed into the database by other people. A dedicated database allows you to retrieve or "access" many different kinds of information on the subject you are studying. The MECC Dataquest: The Fifty States is an example of a dedicated database. It contains a file of information on all fifty U.S. States. This information ranges from each state's population and area to its nickname and motto.

SOCIAL STUDIES THEME: U.S. States

INSTRUCTIONAL PURPOSE: A hands-on introduction to a database and how to access information.

OBJECTIVES:

- Understand the mechanics of a database
- Develop retrieval skills, including searching and reporting
- Use information gathered in a search

GRADE LEVEL: 7-9

PREREQUISITE SKILLS: See UNIT DESCRIPTION. This activity may be used as a first hands-on experience with databases.

TOTAL TIME: 30 minutes or less per student

MATERIALS NEEDED:

- One MECC Dataquest: The Fifty States (database diskette) per computer.
- Apple II+ or IIe computer with 64K with a monitor and one disk drive for each student group.

COMMENTS:

The first hands-on classroom database experience is usually a bit chaotic. The teacher should be very familiar with the program as almost every student will have a question. It would be helpful to have a student aide who has used the program, and can also answer questions.

STUDENT ACTIVITY #1: RETRIEVING INFORMATION

1. Search for the state mottoes of all fifty states. Which state has the motto, "United we stand, divided we fall?"

2. Which three chief manufactured goods do Idaho, Oregon, and Washington produce in common?

3. You love mountain climbing and enter a contest. The prize is a free mountain climbing expedition and you won! The trip is to the highest mountain in the continental United States. Which mountain is it?

4. What is the average population of states bordering the Atlantic Ocean?

DISCUSSION

Your first decision in answering these questions was to decide which of the three options should be selected: (1) All the States, (2) Specific States, or (3) States Selected by Category. What words or phrases helped you select a certain option?

To answer the question in #4, you had to do a math calculation. Remember that a database search will not always produce the exact information for which you are looking. You often must take the information you retrieve and use it to make calculations, interpret the facts that you gather, and make decisions based on those facts.

What is the purpose of the SEARCH menu? What does the REPORT menu do? How do you get from the Search menu to the Report menu?

#2: RECOGNIZING PATTERNS AND ANALYZING RELATIONSHIPS

INTRODUCTION

MECC Dataquest: The Fifty States is a dedicated database which contains a variety of types of information on all U.S. States. This information, if properly accessed and analyzed, can provide you with enough facts to see and predict patterns and trends.

SOCIAL STUDIES THEME: U.S. States

INSTRUCTIONAL PURPOSE: Improve information retrieval skills while introducing ways of analyzing statistics.

OBJECTIVES:

- Learn to recognize patterns and trends given specific information
- Develop appropriate search strategies
- Expand analytical skills

GRADE LEVEL: 7-9

PREREQUISITE SKILLS: See UNIT DESCRIPTION. Students should be familiar with database retrieval skills, including search and report.

TOTAL TIME: One to two class periods

MATERIALS NEEDED:

- One MECC Dataquest: The Fifty States (database diskette) per computer.
- Apple II+ or Apple IIe computer with 64K with a monitor and one disk drive for each student group.

PRE-ACTIVITIES:

1. Students should be familiar with the following terms:
   pattern
   per capita
   ratio
   relationship
   urban

2. A lesson in ratios may be helpful. For example, what is the ratio of blue-eyed or brown-eyed students to the class as a whole.

COMMENTS:

These activities may best be done in groups of three or four. Each student takes a turn at the keyboard, while the others record information.

STUDENT ACTIVITY #2: RECOGNIZING PATTERNS AND ANALYZING RELATIONSHIPS

1. What is the ratio of urban to nonurban residents in states with a 1984 population of more than 12,000,000 people?

2. What is the ratio of urban to nonurban residents in states with a population of less than 750,000 in 1984?

3. Look at the patterns which emerge in #1 and #2. What relationship do you see? What exceptions occur?

4. Find the five states with the highest per capita income. What chief manufactured goods are common to at least four of these states? What is the relationship, if any, between these goods and the high per capita income levels?

5. What are the five states with the lowest per capita income? What four chief manufactured products do they have most in common? What other factor is common to four out of the five states?

6. What patterns do you see emerge from the data collected in #4 and #5? What is the relationship, if any, between salaries people earn and goods produced in a state? What other factors listed in the Search and Report menus could influence per capita income?

DISCUSSION

In these activities, you have seen patterns emerge based on your interpretation of the data you collected. You also noted exceptions in the data. Be very careful not to jump to conclusions when gathering data and developing your answers. Support your answers with complete information. Think about all the different categories which can affect your conclusions and cite examples to support your answers.

#3—INTERPRETING DATA AND MAKING PREDICTIONS

INTRODUCTION

Using MECC Dataquest: The Fifty States, you will search for statistics and do math calculations to help discover answers for a simulation. You will also be asked to interpret the meaning of these statistics and then predict outcomes for the future.

SOCIAL STUDIES THEME: U.S. States

INSTRUCTIONAL PURPOSE: Given a practical situation, discover how to interpret data and predict outcomes based on database information.

OBJECTIVES:

- Learn how to manipulate statistics gathered from a database
- Use database statistics to predict outcomes
- Develop hypothesis using statistics

GRADE LEVEL: 7-9

PREREQUISITE SKILLS: See UNIT DESCRIPTION. Students should have a working knowledge of a database and how to manipulate data.

TOTAL TIME: Two class periods

MATERIALS NEEDED:

- One MECC Dataquest: The Fifty States (database diskette) per computer.
- Apple II+ or IIe computer with 64K with a monitor and one disk drive for each student group. Printer is optional.

PRE-ACTIVITIES:

1. A lesson explaining the Electoral College.

2. Students should understand how electoral votes are assigned.

COMMENTS: This activity would work well with an individual or a small group. Small groups could be assigned to the same problem. It is likely different states would be selected, and students could defend their choices. Or the problem could be divided, for example, by region, which would allow small groups to compile data and predict outcomes by region, and then contribute to a national "report."

STUDENT ACTIVITY #3: INTERPRETING DATA AND PREDICTING OUTCOMES

1. You work for a public relations company and have been hired by a famous politician. She wants you to predict changes in the number of electoral votes for the eleven states with the most electoral votes at the present time. Your client also wants to know which three of these eleven states will have the greatest chance of increasing their number of electoral votes in the future. The politician needs this information so she will know where to concentrate her campaign efforts. She would like the statistical information to be current information, and as specific as possible. What do you discover?

2. What do you think makes these three states different from the other eight you found? Cite statistics or facts to support your answer.

EXTRA CREDIT

In order to answer #1, you had to go through many steps. List, in order, the steps you took to find the answer.

DISCUSSION

In #1, how were your mathematical calculations done? Double check your math formula to make sure your figures will be correct. This kind of statistically-based information can be helpful to people in other ways also. In what ways can you see it being used?

ANSWER KEY FOR STUDENT ACTIVITIES #1, #2, AND #3

Student Activity #1

1. Kentucky
2. Lumber, paper, and processed goods
3. Mount Whitney, California; 14,494'
4. 7,417,300

Student Activity #2

1. California 91.3/8.7, New York 84.6/15.4, Texas 79.6/20.4
2. Delaware 70.6/29.4, North Dakota 48.8/51.2, South Dakota 46.4/53.6, Vermont 33.8/66.2, Wyoming 62.7/37.3
3. Large states tend to be more urban. Delaware is an exception.
4. Common products: processed foods, electrical equipment, fabricated metals, machinery.
5. States with the lowest per capita income (rank): Alabama (46), Arkansas (48), Mississippi (50), Utah (49), West Virginia (47). Common products: primary metals, processed foods, chemicals, electrical equipment.

Student Activity #3

1. California: 8.2% greater than '80-'84, 47 electoral votes
   Florida: 12.6% greater than '80-'84, 21 electoral votes
   Texas: 12% greater than '80-'84, 29 electoral votes